MODEL PROJECT INFORMATION SHEET

NUCLEAR TECHNIQUES TO IMPROVE CHILD NUTRITION

PERU - PER/7/003

SUMMARY

The Government of Peru will conduct two major food supplement intervention programmes to combat the country's malnutrition problems. In the first phase (1994-95), nuclear techniques will be used to improve the evaluation of the effectiveness of one of the intervention programmes, which will target 150,000 pre-school children. In the second phase (1995-97), nutritious food supplements which use local foods and which would sustain significant improvements in the nutrition of undernourished children will be developed and evaluated using nuclear techniques.

Project duration: 3 years. Total budget: US $661,450.

INTRODUCTION

Malnutrition stunts mental and physical growth in one child out of three in developing countries and is a factor in one third of the 13 million child deaths which occur annually in developing countries (UNICEF, 1994). Malnutrition during child-bearing years increases maternal risk during childbirth, leads to low birth weights and to increased prenatal morbidity and mortality. More than 20 million low birth weight children are born every year. More than 90% of them are in developing countries, and most of these are due to maternal malnutrition. According to FAO (1993), approximately 2000 million people in developing countries, mostly children, are iron deficient. Iron deficiency anaemia adversely affects pregnant women and newborns, impairs childrens' mental and motor development, and reduces work productivity. FAO also estimates that 190 million individuals in developing countries suffer from vitamin A deficiency, which breaks down the body's ability to fight infection. Some 13 million children have eye damage resulting from lack of vitamin A; half a million of them go blind annually, and many of those die shortly thereafter. The leading preventable cause of intellectual impairment in the world is iodine deficiency. Stunting is the most prevalent symptom of protein-energy malnutrition; approximately 40% of all two-year-olds in the world are short for their age.

Malnutrition is due primarily to an insufficient amount of food, but inadequate dietary quality and diversity, and infection, are contributing factors. Poor children under five years of age in developing countries suffer from five to ten episodes of infectious diseases per year, as well as numerous subclinical infections. The risk of death from a given disease is doubled for mildly malnourished children and tripled for those who are moderately malnourished.

Peru reported to the International Conference on Nutrition that, on average, 38% of Peruvian children under six years of age are chronically undernourished and an additional 27% are at risk of becoming malnourished. In some regions the average is significantly higher. The most seriously affected are children 6-24 months old. In the coastal regions, 20-30% of all pre-school children and 64-75% of breast-feeding children are iron deficient. Deficiencies of vitamin A, iodine and energy are also major nutrition concerns throughout the country.

The Government will conduct two major food supplement intervention programmes to combat the country's malnutrition problems. In one of these, the National Compensation and Social Development Fund (FONCODES) will provide a food supplement to 150,000 undernourished children under three years of age in three separate regions of the country. The model project will provide nuclear techniques to improve the evaluation of the programme's impact. FONCODES will delegate its counterpart role in the model project to the Instituto Peruano de Energía Nuclear (IPEN) and the Instituto de Investigación Nutricional (IIN) which will assess the nutritional impact of the food supplement in Phase I (1994-95). In Phase II (1995-97), nutritious food supplements which use local foods and which sustain significant improvements in the nutrition of undernourished children will be developed and evaluated using nuclear technologies.

THE ROLE OF NUCLEAR TECHNOLOGY

Recently WHO, FAO and UNICEF have emphasized dietary modification, including dietary diversity, as a means of improving nutrient availability. The key to developing interventions, such as food supplements, to alleviate nutrition problems is the ability to make efficient use of scarce food resources. Isotopes are uniquely and highly suitable for accurately and quickly determining how this can best be accomplished. Isotope techniques have been used extensively in developed countries for the past two decades to provide important information about substantial practical improvements in nutrition. They are particularly useful for designing practical nutrition intervention programmes and for monitoring the effectiveness of such programmes.

OBJECTIVES

The objectives of this model project are to transfer nuclear technologies to Peru for evaluating nutritional status and nutrient bio-availability and to apply the Agency's technologies to achieve the following:

1. To evaluate the food supplement programme.

2. To improve selection and preparation of food products with high nutritional value in which absorption and utilization of macronutrients and micronutrients are optimal.

3. To evaluate the impact of new WHO vitamin A interventions, in collaboration with WHO.

4. To work with local food industries and village feeding programmes to assure sustainability.

5. To develop a package of nuclear techniques in nutrition which can be transferred to other developing countries where undernutrition is a chronic public health concern.

PROJECT IMPLEMENTATION AND MONITORING

Phase I (1994-95): The National Compensation and Social Development Fund (FONCODES) will provide a food supplement to 150,000 undernourished children in Peru for one year, 1995, to which this project will add evaluations of the nutritional status and the nutritional value of foods. These evaluations will be carried out in a representative subsample of the target population by nutrition scientists at IIN in collaboration with IPEN, using nuclear and related technologies. First, baseline (pre-intervention) measurements of nutritional status will be conducted using nuclear technologies, and then food supplements will be distributed. During the course of the food supplement intervention and at its completion, the impact of the supplemental food on nutritional status will be assessed using nuclear and related technologies. Quality control will be achieved through carefully considered project designs and by running duplicate samples in separate laboratories. Adherence to the work plan will be assured through several mechanisms, including co-operation with leading USA laboratories, a vigilant Technical Officer, and the substantial interest of IIN in conducting Phase II of the project.

Phase II (1995-97): Development of Sustainable Intervention: Building on experience gained in Phase I, Phase II will develop a nutritious food supplement for undernourished children, based on optimal use of local foods which are capable of sustaining significant improvements in nutritional status. Nuclear technologies will be used to assess nutritional status, to evaluate the relative nutritional quality of candidate ingredients in the new food supplement for the targeted children, and to determine which ingredients for the new food supplement are most efficient in improving the nutritional status of young children. International food crop research information, general nutrition information already available, and the food industry will be involved in the development of candidate ingredients. The food industry and the Agricultural University will be involved in the food science aspects of the production of the new supplement.

NATIONAL COMMITMENT

The total funding provided by the Government for the supplement programme in which the Agency will participate is US $8,910,000. The Government will also provide the food products, arrange for their distribution, and ensure that the resources needed to sustain the supplement programme are committed to the project. In-kind contributions from Peru will include personnel, office accommodation, laboratories and other facilities. IIN is a WHO Collaborative Centre in Child Nutrition and is the site of several projects funded by WHO and the Pan American Health Organization. IIN will make available nutrition laboratories, a diet kitchen, a computer centre, and personnel such as nurses, nutritionists, physicians and anthropologists.

IMPACT

Phase I: Through the Government's food distribution programme, 150,000 pre-school children will receive a food supplement in one year (1994-95). It is expected that all who receive the supplement will show some improvement in nutritional status, as measured by growth. However, nuclear and related technologies will be used to quantify specific improvements in nutritional status and to relate these improvements to specific nutrients or foods. This information will provide a more rational basis for planning supplemental feeding programmes than would be possible were food intake and growth alone to be used. It is expected that substantial specific improvements in nutritional status, over and above growth alone, will be detectable by the nuclear and related technologies in at least 25% of the children. The cost of the nuclear technologies in the 1994-95 nutrition programme will be approximately US $411,900, or US $2.75 per child, in the Government's food intervention programme.

Phase II (1996-97) will be less expensive, because major equipment will have been purchased during Phase I. On the basis of an estimate of 840,000 undernourished children under three years old in Peru (40% of 2.1 million children in this age range), and the expectation that a significant increase in nutritional status will be achieved in 25% of them, the cost of the nuclear and related technologies in Phase II will be US $0.512 per child.

FINANCES

The budget allocation for the project is US $661,450, distributed as follows:

Year	Experts		Equipment	Fellowships		Scientific Visits		Grp trg.	Sub-contr	Misc Comp	Total
	M/D	US $	US $	M/D	US $	M/D	US $	US $	US $	US $	US $
1995	7/0	79,800	100,000	5/0	16,500	1/0	12,600	-	73.000	-	281,900
1996	6/15	78.000	37,000	5/0	17,250	1/0	13,200	-	135,000	-	280.450
1997	2/0	25.200	-	-	-	0/15	6,900	-	67,000	-	99.100
Total	15/15	183.000	137,000	10	33,750	2/15	32,700	-	275.000	-	661,450

Source of funding: TACF